

REMARKS:

1. This petition for reconsideration is being filed in response to an Office Action of March 25, 2003. Pending claims at the time of the examination were 1, 2 - 7, 8 - 10, and 14 - 16. Examiner withdrew claims 2-7 from examination, rejected claims 1, 8 - 10, and 14 - 16 under 35 U.S.C. § 102(b), and objected to the drawings.
2. **Improper Information Disclosure Statement:** On page 2 of the Office Action, Examiner stated that the listing of references in the specification is not a proper information disclosure statement. Applicant agrees, but notes that an Information Disclosure Statement, along with copies of 13 references, was filed with the application on August 9, 2001. A copy of the IDS and of the return postcard, documenting that the IDS was included with the application, is enclosed herewith, as are copies of the IDS and the cited references. Applicant respectfully requests that Examiner recognize that an IDS was properly filed with the application and review the cited references.
3. **Restriction Requirement:** On page 2 of the Office Action, Examiner stated that claims 2 – 7 were to an unelected species and withdrew them from examination. Applicant respectfully submits that claim 1 is generic to claims 2 – 7 and that claims 2 – 7 should be examined. Claim 2 recites a hub element that is a right cylindrical cone which has, inherently, an angular deficit and which, when assembled to the structure claimed, forms together with an adjacent hub element, a virtual strut between apexes. FIG. 4, as originally filed, is an illustration of the preferred embodiment of the invention and of the elected species. The hub elements 5 of the dome 100, as shown in FIG. 4 are identical to the hub element 5 shown in FIG. 5. Claims 2 – 7 recite elements of the invention that are directly related to the preferred embodiment shown in FIGS. 4 and 5. Accordingly, Applicant requests that Examiner reconsider his withdrawal of claims 2- 7 and re-instate and examine these claims. Furthermore, Applicant respectfully submits that the truncated cone is a sub-species of

the hub element shown in FIGS. 4 and 5 and that claim 1 is generic to new claims 24 – 26 and therefore requests that Examiner enter and review these claims.

4. **Objection to Drawings:** Examiner objected to the drawings under 37 CFR § 1.83(a) for failing to show the construction of the geodesic structure with the different species of hub element. Although the species illustrated in FIGS. 8 and 9 have been withdrawn from consideration and the corresponding claims canceled, Applicant includes informal drawings of FIGS. 15 and 16 with this petition and requests that Examiner enter these figures into the present application.

5. New FIG. 15 illustrates an alternative embodiment of dome 200, constructed of a truncated right cylindrical cone, such as is shown in FIG. 6. The construction of a dome with the hub element shown in FIG. 6 (originally designated as FIG. 7) is discussed in the Specification as filed in paragraph [0054] on page 20. New FIG. 16 illustrates an alternative embodiment of dome 200, constructed with struttet frame element 13, such as is shown in FIGS. 8 and 11 and discussed in paragraph [0055] on page 20 of the Specification as originally filed. These FIGS. 15 and 16 introduce no new subject matter and Applicant requests approval and entry of these figures.

6. The drawing sheet for the FIG. 6 that was originally described in the Specification as filed, was inadvertently left out of the application when it was filed. A Preliminary Amendment was subsequently filed, deleting references to this FIG. 6 and renumbering the reference designation for the remaining figures. The drawing of originally-filed FIG. 6 is herewith submitted as new FIG. 14. FIG. 14 introduces no new subject matter, as it is an illustration of the hub element and angles that are all shown in FIGS. 4 and 5 as originally submitted and amended with the Preliminary Amendment, as well as discussed in section [0048] of the Specification as originally filed. Accordingly, Applicant requests that Examiner enter new FIG. 14 into the present application.

7. **Amendments to the Specification:** Paragraph [0016]: The word "fashion" was inadvertently left out of the first sentence of paragraph [0016] of the Specification as originally filed. The sentence is now amended to read "assembled in an approximate fashion according to some general principle ..." This amendment introduces no new subject matter as this concept is repeatedly discussed in the Specification as filed.

8. New paragraphs [0046], [0047], and [0048] were added to the BRIEF DESCRIPTION OF THE DRAWINGS, introducing new FIGS. 14, 15, and 16. All subsequent paragraph numbers have been amended as shown.

9. In paragraph [0047] as originally filed, now identified as paragraph [0050], the first sentence is amended to read: "FIG. 4 shows a first embodiment of a dome 100 according to the present invention and FIG. 5 a hub element 5 with which the dome 100 is constructed." This amendment is for purposes of clarity and introduces no new subject matter. Additional reference designations for features shown in FIGS. 4 and 5 have been added to the drawings and a clearer description of the lines forming the boundaries of the deficit angle is made in paragraph [0050]. Also added is language describing the vertex 8, which is shown in FIG. 5, and language describing the virtual struts S that are shown in the originally filed FIG. 4.

10. In currently amended paragraph [0051], language has been added describing the imaginary straight line  $l_1$  that forms a boundary for the angle of structure  $\theta$ . This imaginary straight line was shown in FIG. 5 as originally filed. Also added to paragraph [0051] is language referring to FIG. 14. This language was included in the Specification as originally filed, in previously numbered paragraph [0048] on page 17.

11. In the application as originally filed, a reference to FIG. 7 in the first line of page 18 was incorrect. At that time, the correct designation would have been FIG. 6. In currently amended paragraph [0057], the reference is now amended to read FIG. 14.

12. In currently amended paragraph [0057] (previously identified as paragraph [0054]), the term “tapered cone” was corrected in two instances to read “truncated cone.” The term “tapered cone” is redundant, as a cone is, by definition, a tapered figure. As shown in currently numbered FIG. 6, the cone is a truncated cone or a frustum.

13. Applicant submits that none of these amendments introduces new subject matter into the present application and therefore requests that Examiner approve these amendments.

14. **Amendments to the Claims:** Claim 1 was amended to include language from originally filed Claim 8. In addition, language was added to recite a structure that is triangulated by a network of virtual struts. Claim 8 was amended to further define a virtual strut. A discussion of the formation of the virtual struts and the triangulation of the entire structure is found in the Specification as filed in paragraph [0016] on page 8. Furthermore, the network of virtual struts is shown in FIG. 4 as originally filed.

15. Claim 2 was amended to include the language of Claims 3 - 5, which have been canceled, and Claim 6 amended to depend from Claim 2.

16. Claim 7 was amended to more clearly recite the two groups of hub elements that are arranged in an alternating pattern.

17. Claims 9 and 10 remain unchanged; Claims 11 – 14 were canceled; Claims 15 and 16 were amended to depend from claim 1; and claim 15 was also amended to recite a “hub element” instead of a “cone.” No new subject matter has been introduced with any of the above-mentioned amendments and Applicant respectfully requests approval and entry of these amended claims.

18. Claims 17 – 23 have been canceled.

19. New claims 24 – 26 have been added. New Claim 24 recites a self-adjusting structure, wherein the self-adjusting mechanism is provided by a variable strut length. Paragraph [0016] as originally filed contains a discussion of the self-adjusting feature of the structure according to the invention. Particularly, the last sentence in the paragraph describes the varying dimensions between the vertexes, resulting in scalene triangles, which are triangles in which each leg is a different length. The legs of the triangles are the variable struts recited in new Claim 24. Paragraphs [0018] and [0028] on pages 9 and 13, respectively, and originally numbered paragraph [0053] on page 19 of the Specification as originally filed discuss at length the “self-adjusting” feature of the structure.

20. New Claim 25 depends from Claim 2 and recites a hub element that is the truncated cone shown in FIG. 6. Claims 26 and 27 provide additional limitations to claim 25 and recite a construction that is analogous to that of the dome shown in FIG. 10 (constructed with the truncated tapered triangle shown in FIG. 7). FIG. 10 illustrates a dome constructed with the narrow end of the hub element pointing inward toward the center of the dome structure and covered with a skin. Applicant submits that these new claims 24 – 27 do not introduce new subject matter and requests that Examiner approve and enter these new claims into the present application.

21. New method claims 28 – 31 have been added. The steps recited in the method claims are described in section [0049] on page 17 of the specification as filed and do not introduce new subject matter. Applicant respectfully requests entry and allowance of these new claims 28 - 31.

22. **35 U.S.C. § 102(b) Rejections:** On page 3, section 3, Examiner rejected claims 1, 8, 9, and 14-15 under 35 U.S.C. § 102(b) as being anticipated by **Jaeger et al. (U.S. Patent 6,098,347)**. Specifically, Examiner asserts that Jaeger et al. discloses a geodesic structure having “a plurality of hub elements (1) having a vertex (18) and a

hub base (the bottom at 20), ..., an angular deficit, the hub elements [being] inherently able to be randomly arranged adjacent to one another so as to form the geodesic structure." First of all, Applicant notes that the geodesic structure as claimed in Claim 1 of the present application is a *frameless* structure comprising simple hub elements. By contrast, the structure disclosed by Jaeger et al. is constructed of a *pyramidal frame*, which is fabricated sheet-metal frame to which triangular plates are fastened. See col. 1, lines 60 – 67 and FIGS. 1 – 17. The triangular plates do not at all anticipate the hub element of the present application, as those plates, placed one adjacent another, either overlapping or abutting, will not form the geodesic structure claimed in the present application. The pyramidal frames are exactly that, frames, that must be precisely and accurately placed and secured together to form the disclosed structure. The accuracy of placement of the frames is critical, which is the reason that Jaeger et al. also discloses a support structure for holding the frames in place during construction. Applicant respectfully submits that Jaeger et al. does not anticipate the claims as originally filed or as currently amended.

23. Applicant notes the self-adjusting feature of the structure of the present application. This feature of the structure is discussed in the Specification as originally filed in section [0016] on page 8, section [0018] on page 9, section [0028] on page 13, and again in section [[0053] on page 19. (Section numbers are originally filed section numbers). The self-adjustment of the structure is made possible by the constructing the structure with hub elements that form a network of virtual struts. As discussed in the Specification, "self-adjusting" means that the elements may be placed somewhat randomly adjacent one another. By contrast, Jaeger et al. discloses the use of at least three structurally different hub elements, the pentagonally pyramidal frame 1 and triangular sections 2, the hexagonally pyramidal frame 8 and triangular sections 9, the pentagonally pyramidal apex 7 frame and frame 12, and the pentagonally pyramidal apex frame 12 that must be arranged in specific rows and precisely placed within a framework. As shown in Jaeger et al. FIGS. 19 and 20, the structure comprises three

rows of elements. The pentagonal elements provide the base row of elements, hexagonal elements are arranged adjacent to the pentagonal elements on the next row up, and the apex element is mounted at the apex of the structure. Applicant respectfully submits that the Jaeger et al. structure is rigidly and precisely structured and that the pyramidal frames must be arranged in the proper row and precisely adjacent one another. The pentagonal elements may be arranged within the one row that is constructed of pentagonal elements only; the hexagonal elements may be arranged only within the one row that is constructed of hexagonal elements only; and the apex element may be placed only at the apex. This is not a random arrangement of the elements, the adjective "random" meaning unsystematically, or, as defined in The American Heritage Dictionary: "having no specific pattern or objective; ... haphazard." (Exhibit "A" attached.) By contrast, the hub elements of the present invention are randomly placed with disregard to the row. Indeed, the elements of the present invention do not have to be arranged in rows at all.

24. Examiner further states that the hub element of Jaeger et al. is a cone. The basic elements of Jaeger et al. are clearly not cones, the definition of a cone being: "A solid bounded by a region enclosed in a closed curve on a plane and a surface formed by the segments joining each point of the closed curve to a point which is not in the plane." McGraw-Hill Dictionary of Scientific and Technical Terms. Sixth Ed., McGraw-Hill. 2003. (Exhibit "B" attached.) Jaeger et al. refer to these elements more appropriately as pyramidal frames. The pyramidal frame disclosed by Jaeger, whether the pentagonal or hexagonal, is not a solid bounded by a region enclosed in a closed curve on a plane. Rather, the region enclosed on the plane (i.e., the base) is enclosed by either a five- or a six-segmented line, not by a curve, a curve being "a bend without angles; ... a line which changes its direction at every point; a line of which no three consecutive points are in the same direction or straight line." Websters New Universal Unabridged Dictionary. Second Edition. 1983. ISBN 0-671-41819-X. (Exhibit "C" attached.)

25. Applicant respectfully submits that the frame of Jaeger et al. does not anticipate the hub element as recited in claim 1 of the present application. Furthermore, the disclosure of Jaeger et al. does not disclose a structure that is triangulated by a network of virtual struts as claimed in amended Claim 1, much less a structure with virtual struts having variable strut lengths, as claimed in new Claim 24 . Accordingly, Applicant requests that Examiner withdraw his rejection of this claim and the presently depending claims 2, 6 – 10, 15, 16, and new claims 24 – 31.

26. On page 4 of the Office Action, Examiner further rejected claims 1, 3 – 10, and 14 – 16 under 35 U.S.C. § 102(b) as being anticipated by **Chamberlain, U.S. Patent 4,270,320**. Specifically, Examiner asserted that Chamberlain discloses “a geodesic structure having a plurality of hub elements (1) having a vertex (18) ... a virtual strut having a strut length, the virtual strut extending as a straight line between any two adjacent vertexes of the hub element (the virtual line connecting the vertexes at 18),... the hub being a cone (figure 2), ...” Applicant points out that the structure disclosed by Chamberlain is a continuously curved sphere without a single vertex. Chamberlain describes the structure in numerous places of the disclosure as being “substantially spherical”, or “substantially hemispherical” in form and shows in Figures 1, 2, and 7 a structure that is, indeed, a continuously curved hemispherical form, without vertexes. See title and abstract of U.S. Patent 4,270,320, as well as col. 2, lines 7 – 11. The elements disclosed by Chamberlain are, in fact, circular, spherical segments of a sphere. None of the segments disclosed by Chamberlain has a vertex, that is, “a point of intersection of two lines of a figure, opposite to the base and furthest from it.” Particularly, the hub elements taught by Chamberlain, being segments of a sphere, are curved such that no struts, virtual or real, are present in the structure.

27. Currently amended Claim 1 of the present application recites a structure that not only has a plurality of vertexes, but is also “triangulated by a network of virtual struts, any one virtual strut of said network of virtual struts having a strut length and extending

as a straight line between vertexes of any two adjacent hub elements." Applicant respectfully submits that the Chamberlain spherical building structure does not have vertexes and is, therefore, not triangulated with a network of virtual struts. Thus, the Chamberlain structure does not anticipate the invention of the present application as presently claimed in Claim 1. Accordingly, Applicant requests that Examiner withdraw his rejection under 35 U.S.C. § 102(b) of Claim 1 and its dependent claims.

28. Applicant respectfully submits that the cited prior art does not anticipate present Claims 1, 6-10, 15, 16, 24 – 31. Applicant further submits that Claim 1 is generic to Claims 2, 6, and 7 and new Claims 28 – 31 and that these claims should therefore be examined. Accordingly, Applicant requests that Examiner withdraw his rejections and his restriction requirement and allow the presently submitted claims.

29. This response is being filed within the fourth month of the mailing date of the Office Action; a petition for time extension and a one-month late fee of \$55 are included with this petition. The number of claims currently submitted is 17 and the number of independent claims is two; thus, no fees for extra claims are required. Nevertheless, the undersigned herewith authorizes any necessary fees to be taken from the Deposit Account No. 501517 should any fees be required.

Respectfully submitted,



Patricia M. Mathers

Attorney for Applicants

Reg. No. 44,906

Bohan, Mathers & Associates, LLC

P. O. Box 17707

Portland, ME 04112-8707

(207) 773-3132

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Petition f. Time Extension, Check No. for \$55  
New Fig. 14 (1 sheet formal drawing)  
New Figs. 15 & 16 (2 sheets informal drawings)  
Exhibits "A", "B", and "C"  
Copy of IDS, cited references, & return postcard